UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/584,077	06/22/2006	Kiminori Mizuuchi	2006_1008A	8768

52349 7590 05/26/2009

WENDEROTH, LIND & PONACK L.L.P.
1030 15th Street, N.W.
Suite 400 East
Washington, DC 20005-1503

EXAMINER	
VAN ROY, TOD THOMAS	

ART UNIT	PAPER NUMBER
2828	

MAIL DATE	DELIVERY MODE
05/26/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/584,077	MIZUUCHI ET AL.	
	Examiner	Art Unit	
	TOD T. VAN ROY	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 February 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *5* is/are allowed.

6)☒ Claim(s) *1,3,4 and 6-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings are accepted.

Specification

The amended specification is accepted.

Claim Rejections - 35 USC § 112

The previous 112 rejection of claim 4 is withdrawn.

Response to Amendment

The Examiner acknowledges the amending of claims 1, 3-8, 12-13, and the cancellation of claims 2 and 20-25.

Response to Arguments

Applicant's arguments with respect to claims 1 and 3-19 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 3, 6-7, 9-11, and 15-19 are rejected under 35 U.S.C. 103(a) as being obvious over Shimizu (JP 11-233889, Applicant submitted prior art).

With respect to claim 1, Shimizu teaches a surface emitting semiconductor laser comprising: a semiconductor laminated body including an active layer (fig.1 #13), and a plurality of semiconductor layers (fig.1) disposed on a semiconductor substrate (fig.1 #21), and a pair of electrodes for injecting current into the active layer (fig.1 #s 16/18), wherein one of said electrodes comprises a single electrode layer (fig.1 #16, single layer separated by holes) in contact with said semiconductor laminated body defining a contact area (fig.1 area around #16), the contact area having a center portion and a peripheral portion at least partially surrounding the center portion, the peripheral portion having an outer periphery and an area density that decreases from the center portion to the outer periphery (fig.1 #16 completely filled in center, gaps out to the edges), such that injection of current from said one electrode into the active layer is carried out with different current densities for a center portion of said one electrode and for a peripheral portion thereof (fig.1 shape of #16, [0019]). Shimizu does not teach the area density to *continuously* decrease from a center to the edge. It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the decreasing area density of Shimizu to a continuously decreasing area density as a matter of engineering design choice not materially effecting the current injection profile of Shimizu ([0034] Shimizu

teaches the electrode pattern can be arbitrary as long as the current profile matches that of the fundamental mode).

With respect to claim 3, Shimizu teaches plural fine holes are formed in the electrode layer constituting said one electrode so that the occupation density of the fine holes differs between the center portion of said one electrode and the peripheral portion thereof (fig.3, one hole near to the center, two holes near the periphery).

With respect to claim 6, Shimizu further teaches a resonator for amplifying the light in the active layer (inherent), said resonator comprising a reflection layer included in the semiconductor body (fig.3 #14), and an external mirror disposed separately from the body ([0036]).

Shimizu does not disclose the particular mirror shape of claim 7. However these mirrors are well known in the art. The particular mirror shape used in Shimizu does not appear critical to the operation of the device, therefore it would have been obvious to one skilled in the art to substitute the known mirror into the system of Shimizu by an obvious engineering design choice.

With respect to claims 9-11, Shimizu teaches the device outlined above, but does not teach the stated wavelength ranges. It would have been obvious to one of ordinary skill in the art at the time of the invention to change the active material of Shimizu to emit at different wavelengths in order to obtain needed frequency outputs for communications use.

With respect to claims 15-16, Shimizu teaches one laser, not multiple devices. It would have been obvious to one of ordinary skill in the art at the time of the invention to

add additionally devices of Shimizu into a polygonal output arrangement to increase the amount of power output and achieve a desired beam profile.

With respect to claim 17, the laser of Shimizu can be considered a laser projector in and of itself.

With respect to claims 18-19, Shimizu teaches the device outlined above, but does not teach a multimode device with a 1nm vertical mode spectrum. Shimizu does teach adjustment of the external mirror ([0036]). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the mirror adjustment of Shimizu with the ability to operate in multimodes with a defined profile, as it is known that cavity length adjustment affects these properties and would allow for desired output characteristics to fit a given application.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Marta et al. (US 5745515).

With respect to claim 8, Shimizu teaches the device outlined above, but does not teach the use of a saturation absorber layer. Marta teaches a vertical emission device which use absorber layers (abs.). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the device of Shimizu with the absorber of Marta in order to utilize optical gating or switching (Marta, abs.).

Claims 12 and 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Mooradian (WO 98/43329, Applicant submitted prior art).

With respect to claims 12 and 14, Shimizu teaches the device outlined above, but does not teach the use of nonlinear crystals. Mooradian teaches a similar vertical emission device using a nonlinear crystal (abs.). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the device of Shimizu with the crystal of Mooradian in order to create light of a different frequency.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu in view of Iga et al. (JP 02-052485, Applicant submitted prior art).

With respect to claim 13, Shimizu teaches the device outlined above, and further teaches potential reduction of the substrate thickness ([0025]). Shimizu does not teach the substrate to have a concave portion removed. Iga teaches a vertical emission device wherein a concave portion of the substrate is removed (abs.). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the device, and substrate thickness reduction teaching, of Shimizu with the concave substrate removal of Iga as a means to remove any transparency problems with the substrate material.

The "etching" limitations are rejected for the same reasons as claim 14. These limitations merely detail the methods of forming the device. The method of forming a device is not germane to the patentability of the device itself, therefore these limitations are not given patentable weight. At best this could be characterized as product-by-process limitation, where the process limitations are not limiting, only the structure

implied by the process. See MPEP 2113. Here, the structure implied by the process steps is merely the structure of claim 14.

Allowable Subject Matter

Claim 5 is allowed.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TOD T. VAN ROY whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TVR/

/Minsun Harvey/
Supervisory Patent Examiner, Art Unit 2828